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26161	7590	11/03/2003	EXAMINER	
FISH & RICHARDSON PC 225 FRANKLIN ST BOSTON, MA 02110			CANTELMO, GREGG	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 11/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

10/022,272

Applicant(s)

CHRISTIAN ET AL.

Examiner

Gregg Cantelmo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-43 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 & 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statements received March 29, 2002 and May 10, 2002 have been placed in the application file and the information referred to therein has been considered as to the merits.
2. With respect to item AQQ on the IDS received March 29, 2002, this reference does not appear to have any relevance to the instant invention. Note this reference is drawn to a laser with longitudinal mode selection.

Drawings

3. The drawings received December 20, 2001 are acceptable for examination purposes.

Specification

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Nickel oxyhydroxide cathode containing a gold salt additive for an alkaline battery.

5. The disclosure is objected to because of the following informalities: the status of the various U.S. applications listed in the specification should be brought up to date (see pages 4 and 7 as examples).

Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 2, 5-10, 21, 23, 33-35, 38-39, 40-42 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1148029-A2 (EP '029) in view of JP 2001-202956-A (JP '956).

EP '029 discloses an alkaline battery and method of making comprising: a cathode comprising spherical beta nickel oxyhydroxide (abstract), a zinc anode, a separator between the anode and cathode (Fig. 1) and an alkaline electrolyte (as applied to claims 1, 34 and 40).

The cathode mixture is formed by mixing an aqueous alkaline solution containing the alkaline electrolyte and nickel oxyhydroxide (paragraph 0049] as applied to claim 41).

EP '029 discloses providing a positive electrode material in a nickel zinc battery having a substantially spherical particles of beta NiOOH active material (abstract as applied to claims 2, 5, 35, 38, 42 and 44).

The anode comprises a gelling agent (paragraph [005] as applied to claim 10).

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The cathode further has a carbon material (claim 29 as applied to instant claim 33).

The differences between the instant claims and EP '029 are that EP '029 does not teach of adding a gold salt to the nickel oxyhydroxide active material (claims 1, 6, 34 and 40) or of the content of the gold salt in the electrode active material (claims 7-9, 21-23 and 39).

JP '956 disclose of adding trivalent metal ions including gold to the nickel oxyhydroxide active material. JP '956 discloses an alkaline battery comprising: a cathode comprising nickel oxyhydroxide and a gold additive (abstract and paragraph [0034]), an anode, a separator between the anode and cathode (paragraphs [0031]-[0032] and Fig. 2) and an alkaline electrolyte (paragraph [0035] as applied to claims 1, 34 and 40).

The genus of JP '956 are all representative of elements capable of having a +3 oxidation state. Thus in providing such materials to the cathode, it would have been obvious to provide these materials in the form of a salt to render them active. Simply providing them in atomic form as opposed to ionic form would not have rendered the additive element in the capacity as an active material.

Furthermore see paragraph [0023] wherein the second component, such as the gold element, is provided in the form of a compound such as an oxide, hydroxide, halogenide, etc. Thus the gold is provided in the form of a metal salt.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of EP '029 by adding a gold trivalent ion additive to the nickel oxyhydroxide since it would have

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improved the rate of discharge of the cell and the charging efficiency of the cell. It would have further been obvious to select the gold to be in the form of a gold salt since it would presented the additive material in a form capable of dissolving the salt and providing the trivalent metal ion additive and thus have enhanced the active nature of the gold additive in the cathode material.

One of ordinary skill in the art would have further found it obvious to modify the content of the gold material in the positive active material to optimize it to a preferred value such as those recited in the instant claims to optimize the charge/discharge characteristics of the cell.

Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesche, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

8. Claims 3, 36 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP '029 in view JP '956 as applied to claims 1, 34 and 40 above, and further in view of Megahed et al. "Stable gamma NiOOH/Zn button cells for electronic applications" (hereinafter referred to as Megahed).

The teachings of claims 1, 34 and 40, with respect to EP '029 in view of JP '956, have been discussed above and are incorporated herein.

The difference not yet discussed are of the nickel oxyhydroxide including gamma-NiOOH (claims 3, 36 and 42).

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Megahed teaches of using gamma-NiOOH in the positive electrode material (abstract).

The motivation for using the gamma-NiOOH is that it improves the cell performance such as higher flash current and lower impedance (page 56).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of EP '029 by using gamma-NiOOH since it would have improved the cell performance such as higher flash current and lower impedance.

9. Claims 2-4, 35-37 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP '029 in view of JP '956 as applied to claims 1, 34 and 40 above, and further in view of JP 06-260166-A (JP '166).

The teachings of claims 1, 34 and 40, with respect to EP '029 in view of JP '956, have been discussed above and are incorporated herein.

The difference not yet discussed are of the nickel oxyhydroxide including gamma-NiOOH and/or beta-NiOOH.

EP '029 discloses the presence of beta-NiOOH in the positive electrode active material.

JP '166 discloses that during charging and discharging, both gamma-NiOOH and beta-NiOOH exist (abstract).

With respect to beta-NiOOH in charged state, when charging is conducted under low-temperature atmosphere or charging is conducted for a long period of time, or overcharging is repeated, a part thereof is oxidized to form gamma-NiOOH having a higher Ni oxidation state than beta-NiOOH.

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Thus there is an expectation that upon the charging and discharging of the cell, the amount of beta-NiOOH and gamma-NiOOH will be present relative to the charge/discharge cycle.

10. Claims 11-13, 15, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP '029 in view of JP '956 as applied to claims 1, above, and further in view of Megahed and EP 883198-A1 (EP '198).

The teachings of claims 1, 34 and 40, with respect to EP '029 in view of JP '956, have been discussed above and are incorporated herein.

The cathode comprises a gelling agent (paragraph [0050] as applied to claim 18).

The differences not yet discussed are of the cobalt oxyhydroxide coating on the NiOOH (claims 11-13) of the nickel oxyhydroxide derived from beta-nickel hydroxide (claim 16), of the gold salt (claim 17).

With respect to the cobalt oxyhydroxide coating on the NiOOH:

EP '198 discloses providing a substantially uniform cobalt oxyhydroxide coating on the NiOOH particles (abstract as applied to claims 11-13 and 16-18).

The motivation for providing a substantially uniform cobalt oxyhydroxide coating on the NiOOH particles is that it improves the corrosion resistance of the NiOOH (col. 6, ll. 37-48).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of EP '029 by

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forming a cobalt oxyhydroxide coating on the NiOOH particles since it would have provided a cathode active material having improved corrosion resistance.

With respect to the derivation of nickel oxyhydroxide derived from beta-nickel hydroxide:

Megahed teaches of using gamma-NiOOH in the positive electrode material (abstract).

The alpha-nickel hydroxide of claim 15 is a precursor for forming the gamma-nickel oxyhydroxide. Since Megahed has gamma-nickel oxyhydroxide as discussed above, the derivation of this material, absent criticality and unexpected results, is not germane to the patentability of the claimed invention. This is treated as a product-by-process limitation in the at the oxyhydroxide product is derived from a process using alpha-nickel hydroxide.

The motivation for using the gamma-NiOOH is that it improves the cell performance such as higher flash current and lower impedance (page 56).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of EP '029 by using gamma-NiOOH since it would have improved the cell performance such as higher flash current and lower impedance.

Since Megahed has gamma-nickel oxyhydroxide, Megahed is held to read on the nickel oxyhydroxide component (as applied to claim 15).

With respect to the gold salt of claim 17:

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JP '956 disclose of adding trivalent metal ions including gold to the nickel oxyhydroxide active material. JP '956 discloses an alkaline battery comprising: a cathode comprising nickel oxyhydroxide and a gold additive (abstract and paragraph [0034]), an anode, a separator between the anode and cathode (paragraphs [0031]-[0032] and Fig. 2) and an alkaline electrolyte (paragraph [0035] as applied to claim 17).

The genus of JP '956 are all representative of elements capable of having a +3 oxidation state. Thus in providing such materials to the cathode, it would have been obvious to provide these materials in the form of a salt to render them active. Simply providing them in atomic form as opposed to ionic form would not have rendered the additive element in the capacity as an active material.

Furthermore see paragraph [0023] wherein the second component, such as the gold element, is provided in the form of a compound such as an oxide, hydroxide, halogenide, etc. Thus the gold is provided in the form of a metal salt.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of EP '029 by adding a gold trivalent ion additive to the nickel oxyhydroxide since it would have improved the rate of discharge of the cell and the charging efficiency of the cell. It would have further been obvious to select the gold to be in the form of a gold salt since it would presented the additive material in a form capable of dissolving the salt and providing the trivalent metal ion additive and thus have enhanced the active nature of the gold additive in the cathode material.

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11. Claims 11-13, 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP '029 in view of JP '956 as applied to claims 1, above, and further in view of EP 883198-A1 (EP '198).

The teachings of claims 1, 34 and 40, with respect to EP '029 in view of JP '956, have been discussed above and are incorporated herein.

The cathode comprises a gelling agent (paragraph [0050] as applied to claim 18).

The differences not yet discussed are of the cobalt oxyhydroxide coating on the NiOOH (claims 11-13) of the nickel oxyhydroxide derived from beta-nickel hydroxide (claim 16), of the gold salt (claim 17).

With respect to the cobalt oxyhydroxide coating on the NiOOH:

EP '198 discloses providing a substantially uniform cobalt oxyhydroxide coating on the NiOOH particles (abstract as applied to claims 11-13 and 16-18).

The motivation for providing a substantially uniform cobalt oxyhydroxide coating on the NiOOH particles is that it improves the corrosion resistance of the NiOOH (col. 6, ll. 37-48).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of EP '029 by forming a cobalt oxyhydroxide coating on the NiOOH particles since it would have provided a cathode active material having improved corrosion resistance.

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With respect to the derivation of nickel oxyhydroxide derived from beta-nickel hydroxide:

The beta-nickel hydroxide of claim 16 is a precursor for forming the nickel oxyhydroxide. Since EP '198 has beta-nickel oxyhydroxide as discussed above, the derivation of this material, absent criticality and unexpected results, is not germane to the patentability of the claimed invention. This is treated as a product-by-process limitation in the at the oxyhydroxide product is derived from a process using beta-nickel hydroxide.

Since EP '029 has beta-nickel oxyhydroxide, EP '029 is held to read on the nickel oxyhydroxide component (as applied to claim 16).

With respect to the gold salt of claim 17:

JP '956 disclose of adding trivalent metal ions including gold to the nickel oxyhydroxide active material. JP '956 discloses an alkaline battery comprising: a cathode comprising nickel oxyhydroxide and a gold additive (abstract and paragraph [0034]), an anode, a separator between the anode and cathode (paragraphs [0031]-[0032] and Fig. 2) and an alkaline electrolyte (paragraph [0035] as applied to claim 17).

The genus of JP '956 are all representative of elements capable of having a +3 oxidation state. Thus in providing such materials to the cathode, it would have been obvious to provide these materials in the form of a salt to render them active. Simply providing them in atomic form as opposed to ionic form would not have rendered the additive element in the capacity as an active material.

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Furthermore see paragraph [0023] wherein the second component, such as the gold element, is provided in the form of a compound such as an oxide, hydroxide, halogenide, etc. Thus the gold is provided in the form of a metal salt.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of EP '029 by adding a gold trivalent ion additive to the nickel oxyhydroxide since it would have improved the rate of discharge of the cell and the charging efficiency of the cell. It would have further been obvious to select the gold to be in the form of a gold salt since it would presented the additive material in a form capable of dissolving the salt and providing the trivalent metal ion additive and thus have enhanced the active nature of the gold additive in the cathode material.

12. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP '029 in view of JP '956 as applied to claims 1, above, and further in view of EP 932211-A (EP '211).

The teachings of claim 1, with respect to EP '029 in view of JP '956, have been discussed above and are incorporated herein.

The difference not yet discussed is of adding manganese to the NiOOH.

EP '211 discloses adding Mn to a NiOOH active material (abstract).

The motivation for adding Mn to NiOOH in a positive electrode active material is that it increases the number of electrons participating in reaction of Ni and the capacity density of the battery is improved (paragraph [0012]).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of EP '029 by

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adding Mn to NiOOH in a positive electrode active material since it would have increased the number of electrons participating in reaction of Ni and the capacity density of the battery is improved.

13. Claims 20, 24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP '029 in view of JP '956 as applied to claims 1, above, and further in view of U.S. patent No. 5,508,121 (Sawa).

The teachings of claim 1, with respect to EP '029 in view of JP '956, have been discussed above and are incorporated herein.

The differences not yet discussed is of adding a form of manganese to the NiOOH.

Sawa teaches of adding manganese such as MnO₂ and KMnO₄ (abstract).

The motivation for adding such forms of Mn to NiOOH in a positive electrode active material is to increase the rate of absorption of the hydrogen gas generated in the battery thus resulting in a reduction of the internal pressure of the battery (abstract).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of EP '029 by adding a form Mn to NiOOH in a positive electrode active material as taught by Sawa since it would have increased the rate of absorption of the hydrogen gas generated in the battery and resulted in a reduction of the internal pressure of the battery.

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14. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP '029 in view of JP '956 as applied to claims 1, above, and further in view of JP 08-329937-A (JP '937).

The teachings of claim 1, with respect to EP '029 in view of JP '956, have been discussed above and are incorporated herein.

The difference not yet discussed is of adding CaS to the NiOOH.

JP '937 discloses adding CaS to a NiOOH active material (abstract).

The motivation for adding CaS to NiOOH in a positive electrode active material is that it enhances the utilization factor of the electrode active material at higher operating temperatures (paragraph [0012]).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of EP '029 by adding CaS to NiOOH in a positive electrode active material since it would have enhanced the utilization factor of the electrode active material at higher operating temperatures.

15. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP '029 in view of JP '956 as applied to claims 1, above, and further in view of U.S. patent No. 6,027,834 (Hayashi).

The teachings of claim 1, with respect to EP '029 in view of JP '956, have been discussed above and are incorporated herein.

The difference not yet discussed is of adding thulium oxide to the battery.

Hayashi discloses adding thulium oxide to a nickel battery (abstract).

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The motivation for adding thulium oxide to a nickel battery is that it enhances the utilization factor of the electrode active material over a broad temperature range (col. 7, ll. 48-55).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of EP '029 by adding thulium oxide to a nickel battery since it would have enhanced the utilization factor of the electrode active material over a broad temperature range.

16. Claims 27 and 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent No. 6,248,478 (Friend) in view of JP '956.

Friend discloses a primary battery comprising a NiOOH cathode, zinc anode, alkaline electrolyte and a separator between the electrodes (Fig. 1 and paragraph bridging columns 1 and 2).

The differences between Friend and the instant claims are that Friend does not disclose of adding a gold salt to the assembly (claim 1) or of the cell having the claimed capacity losses (claims 30-32).

With respect to adding a gold salt to the positive active material:

JP '956 disclose of adding trivalent metal ions including gold to the nickel oxyhydroxide active material. JP '956 discloses an alkaline battery comprising: a cathode comprising nickel oxyhydroxide and a gold additive (abstract and paragraph [0034]), an anode, a separator between the anode and cathode

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(paragraphs [0031]-[0032] and Fig. 2) and an alkaline electrolyte (paragraph [0035] as applied to claims 1, 34 and 40).

The genus of JP '956 are all representative of elements capable of having a +3 oxidation state. Thus in providing such materials to the cathode, it would have been obvious to provide these materials in the form of a salt to render them active. Simply providing them in atomic form as opposed to ionic form would not have rendered the additive element in the capacity as an active material.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of EP '029 by adding a gold trivalent ion additive to the nickel oxyhydroxide since it would have improved the rate of discharge of the cell and the charging efficiency of the cell. It would have further been obvious to select the gold to be in the form of a gold salt since it would presented the additive material in a form capable of dissolving the salt and providing the trivalent metal ion additive and thus have enhanced the active nature of the gold additive in the cathode material.

With respect to the claimed capacity loss:

The prior art has the same obvious components as recited in claim 1 and is a primary battery.

Claims 30-32 claim operational results of the battery of claims 1 and 27.

Since the prior art has the same components as those recited in claims 1

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and 27 and claims 30-32 fail to recite additional structure to the apparatus, it is held that the prior art will obviously have the same capacity loss as recited in claims 30-32, absent clear evidence to the contrary.

Conclusion

.Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (703) 305-0635. The examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 5:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (703) 308-2383. Note that these telephone numbers will change around January 1, 2004. At such time the examiners new telephone number will be (571) 272-1283 and the examiner's supervisor's number will be (571) 272-1292. FAX communications should be sent to FAX number: (703) 872-9306. FAXES received after 4 p.m. will not be processed until the following business day. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gregg Cantelmo
Patent Examiner
Art Unit 1745

gc



October 30, 2003